XML Technologies

XSL, XPath, XLink, XPointer, Xquery

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What are the XML Technologies?

The XML technologies are a set of modules that provides XML users with useful services.

The XML Technologies more used:

- **XSL**: eXtensible Stylesheet Language.
- **XPath**: provides a common syntax and semantics for functionality shared between XSLT and XPointer.
- **XLink**: language that allows elements to be inserted into XML documents in order to create and describe links between resources.
- **XQuery**: query language. It facilitates the data extraction from XML documents.
XSL – More Than a Style Sheet Language

**XSL** stands for **eXtensible Style Language**. It was developed by the World Wide Web Consortium.

**XSL** describes how the XML document should be displayed.

**XSL** consists of three parts:

- **XSLT**: a language for transforming XML documents.
- **XPath**: a language for navigating in XML documents.
- **XSL-FO**: a language for formatting XML documents.

[http://www.w3.org/](http://www.w3.org/)
I. **XSLT**: XSL Transformations

**XSLT** is the most important part of **XSL**.

**XSLT** is used to transform an XML document into another XML document or another type of document that may be recognized by a browser, like HTML and XHTML.

Normally, **XSLT** does this by transforming each XML element into an (X)HTML element.

With **XSLT** you can add/remove elements and attributes to or from the output file.
I. XSLT: XSL Transformations

A common way to describe the transformation process is to say that XSLT transforms an XML source-tree into and XML result-tree.
II. Xpath in XSL

XPath is used in XSL Transformations to find information in an XML document.

Xpath is used to navigate through elements and attributes in XML documents.

More about XPath later...
III. **XSL-FO**: XSL Formatting Objects

**XSL-FO** is an XML language describing the formatting of XML data for output to screen, paper or other media.

**XSL-FO** is formally named **XSL**.

**XSL-FO** documents are XML files with output information. They contain information about the output layout and output contents.
What is **XPath**?

**XPath** uses path expressions to select nodes or node-sets in an XML document.

**XPath** includes over 100 functions. There are functions for string values, numeric values, date and time comparison, node and QName manipulation and more.

**XPath** is used in others XML languages.

[http://www.w3.org/](http://www.w3.org/)
**XLink** language allows elements to be inserted into XML documents in order to create and describe links resources.

**XLink** allows XML documents to:

- Assert linking relationships among more than two resources.
- Associate metadata with a link.
- Express links that reside in a location separate from the link resources.
XQuery: a query language

- **Xquery** is the language for querying XML data.
- **Xquery** for XML is like SQL for databases.
- **Xquery** is built on Xpath expressions.
- **Xquery** is supported by all the major databases engine (IBM, Oracle, Microsoft...).
What is the relation between XBRL and XML technologies?

- XBRL is a language based on XML and therefore all XML technologies may be used in XBRL.
How can these technologies be used in XBRL?

- **XBRL** uses intensively XLink in taxonomies and instances:

```xml
<annotation>
  <appinfo>
    <link:xlinkbaseRef xlink:type='simple' xlink:href='d-et-2005-12-31-presentation.xml'
    <link:xlinkbaseRef xlink:type='simple' xlink:href='d-et-2005-12-31-definition.xml'
    <link:xlinkbaseRef xlink:type='simple' xlink:href='d-et-2005-12-31-label.xml'
    <link:xlinkbaseRef xlink:type='simple' xlink:href='d-et-2005-12-31-reference.xml'
  </appinfo>
</annotation>
```

**XBRL Taxonomy Schema (.xsd)**

XLink attributes:
- xlink:href
- xlink:role
- xlink:arcrole
- xlink:title
How can these technologies be used in XBRL?

**XBRL Instance Document (.xbrl)**

```xml

<link:schemaRef xlink:type='simple' xlink:href='t-mc-2005-12-31.xsd'/>
<link:schemaRef xlink:type='simple' xlink:href='t-md-2005-12-31.xsd'/>
<link:schemaRef xlink:type='simple' xlink:href='t-ow-2005-12-31.xsd'/>
<link:schemaRef xlink:type='simple' xlink:href='t-mf-2005-12-31.xsd'/>

<context id='context-1'>
  <entity>
    <identifier scheme='www.mycompany.com'>My Company</identifier>
  </entity>
  <period>
    <instant>2006-01-24</instant>
  </period>
  <scenario>
    <xbrldi:explicitMember xlink:type='simple' xlink:href='t-mf-2005-12-31.xsd/t-mf_PositionsNonReportingCurrenciesDimension'>d-rec:Euro</xbrldi:explicitMember>
  </scenario>
</context>
```
XSLT is used in XBRL to show instance documents in whatever format you want:

**Instance Document (.xbrl)**

**Instance Document (.html)**

XSLT Transformation
How can these technologies be used in XBRL?

**XQuery** is used for retrieving data from **XBRL** Taxonomy and Instances files.
The End...

It’s your time...